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Appendix A: Building and Foundation Planting Chart, 1 of 4

Buildings of Fort Hancock and Foundation Planting Category

Building Name		Date	Historical Use	Present Use	Management	Planting Category
Lieutenants Quarters	1	1898	Housing	Museum	NPS	Residential
Lieutenants Quarters	2	1898	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	3	1898	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	4	1898	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	5	1899	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	6	1899	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	7	1899	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	8	1899	Housing	Vacant	Historic Lease	Residential
Captains Quarters	9	1899	Housing	Vacant	Historic Lease	Residential
Captains Quarters	10	1899	Housing	Vacant	Historic Lease	Residential
Captains Quarters	11	1899	Housing	Vacant	Historic Lease	Residential
Commander's Quarters	12	1899	Housing	Vacant	Historic Lease	Residential
Captains Quarters	13	1899	Housing	Vacant	Historic Lease	Residential
Captains Quarters	14	1899	Housing	Vacant	Historic Lease	Residential
Captains Quarters	15	1899	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	16	1899	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	17	1899	Housing	Vacant	Historic Lease	Residential
Lieutenants Quarters	18	1899	Housing	Park Partner	Historic Lease	Residential
Hospital Steward Quarters	20	1899	Housing	Education Partnership	Cooperative Agreement	Residential
2-Family Officers Quarters	21	1939	Housing	NPS Housing	Historic Lease	Residential
Enlisted Barracks	22	1899	Housing	Education Partnership	Cooperative Agreement	Public/Barracks
Enlisted Barracks	23	1899	Housing	Vacant	Historic Lease	Public/Barracks
Enlisted Barracks	24	1898	Housing	Vacant	Historic Lease	Public/Barracks
Enlisted Barracks	25	1898	Housing	Vacant	NPS	Public/Barracks
Post Headquarters	26	1899	Headquarters	Offices	Historic Lease	Public
Bachelor Officers Quarters	27	1899	Housing	Vacant	Historic Lease	Residential
Post Guardhouse	28	1899	Post Jail	Museum	NPS	Service
NCO Quarters	29	1899	Housing	NPS Housing	NPS	Residential
NCO Quarters	30	1898	Housing	NPS Housing	NPS	Residential
Quartermaster Storehouse	32	1898	Warehouse	NPS Operations	NPS	Service
Bakery	33	1898	Bakery	Vacant	Historic Lease	Service

Appendix A: Building and Foundation Planting Chart, 2 of 4

Building Name		Date	Historical Use	Present Use	Management	Planting Type
Fire Station Office	34	1899	Office/ Dormitory	NPS Operations	NPS	Service
Chapel/ Auditorium	35	1941	Chapel	Reception / Events	Historic Lease (Shared Use)	-
Mule Stables	36	1899	Stable	Vacant	Historic Lease	Service
Pump House	37	1928	Pump Station	Pump Station	NPS	Service
YMCA / Gymnasium	40		YMCA/ Gym	Gym/US Post Office	Historic Lease	Public/Barracks
Post Office	41	1941	Post Office	NPS Housing	NPS	Public/Barracks
Quartermaster Latrine	44	1899	Latrine	Vacant	NPS	Service
Shell Warehouse	45	1921	Warehouse	NPS Operations	NPS	Service
Commissary	47	1900	Storehouse	NPS Operations	NPS	Public
Warehouse	49	1942	Warehouse	NPS Operations	NPS	Service
Fire House #1	51	1905	Firehouse	NPS Operations	NPS	Service
NCO Quarters	52	1905	Housing	NPS Housing	NPS	Residential
Post Exchange	53	1905	Exchange/ Offices	Education Partnership	Cooperative Agreement	Public/Barracks
Mess Hall	55	1905	Kitchen/ Dining	Vacant	Historic Lease	Public/Barracks
Mess Hall	56	1905	Kitchen/ Dining	Vacant	Historic Lease	Public/Barracks
Mess Hall	57	1905	Kitchen/ Dining	Vacant	Historic Lease	Public/Barracks
Mess Hall	58	1905	Kitchen/ Dining	NPS Operations	NPS	Public/Barracks
Gas Station	60	1936	Gas Station	Vacant	Historic Lease	Service
NCO Quarters	64	1907	Housing	NPS Housing	NPS	Residential
Storehouse	65	1905	Storehouse	NPS Operations	NPS	Service
NCO Quarters	66	1908	Housing	NPS Housing	NPS	Residential
Post Theater	67	1933	Theater	Theater/ Meeting	Historic Lease (Shared Use)	Public/Barracks
Post Exchange/ Gymnasium	70	1909	P.X./Gym	Storage	Historic Lease	Public/Barracks
NCO Quarters	71	1909	Housing	NPS Housing	NPS	Residential
NCO Quarters	72	1909	Housing	NPS Housing	NPS	Residential
NCO Quarters	73	1909	Housing	NPS Housing	NPS	Residential

Appendix A: Building and Foundation Planting Chart, 3 of 4

Building Name		Date	Historical Use	Present Use	Management	Planting Type
Enlisted Barracks	74	1909	Housing	State Offices	State of NJ	Public/Barracks
NCO Quarters	75	1910	Housing	NPS Housing	NPS	Residential
Fire House #2	76	1910	Fire House	NPS Operations	NPS	Service
Laundry	77	1941	Laundry	Educational Partnership	Cooperative Agreement	Service
Oil and Paint Storehouse	79	1918	Storehouse	Storage	Historic Lease	Service
2-Family NCO Quarters	80	1910	Housing	Vacant	Historic Lease	Residential
Lighthouse Keepers Quarters	84	1883	Housing	Education Partnership	Cooperative Agreement	Residential
Barn	85	1910	Barn/ Garage	Museum	NPS	Service
Proving Ground Barracks	102	1909	Barracks	Education Center	NPS	Public/Barracks
NCO Quarters	104	1894	Housing	NPS Operations	NPS	Public/Barracks
NCO Quarters	108	1905	Housing	NPS Operations	NPS	Public/Barracks
Laundry	113	1905	Laundry	Vacant	NPS	Service
Officers Club	114	1878	Housing	Vacant	Historic Lease	Public/Barracks
WWII Barracks	119	1941	Barracks	Vacant	NPS	Public/Barracks
WWII Barracks	120	1941	Barracks	Vacant	NPS	Public/Barracks
Power Plant	124	1907	Power Plant	Storage	Historic Lease	Service
Motor Shop	125	1907	Motor Shop	NPS Storage	Historic Lease	Service
Proving Ground Storehouse	130	1907	Maintenance Shops	NPS Operations	NPS	Service
Proving Ground Shelter House	131	1907	Maintenance Shops	NPS Operations	NPS	Service
Proving Ground Paint Shop	132	1907	Maintenance Shops	NPS Operations	NPS	Service
Proving Ground Storehouse	134	1907	Maintenance Shops	NPS Operations	NPS	Service
Officers Quarters	144	1939	Housing	NPS Housing	NPS	Residential
Officers Quarters	145	1939	Housing	NPS Housing	NPS	Residential
Warehouse	156	1942	Warehouse	NPS Operation	NPS	Service

Appendix A: Building and Foundation Planting Chart, 4 of 4

Building Name		Date	Historical Use	Present Use	Management	Planting Type
Laundry/Latrine	157	1967	Latrine	Restroom	NPS	Service
Latrine	300	1940	Latrine	Vacant	NPS	Public/Barracks
Officers Mess	301	1941	Kitchen/ Dining	Educational Partnership	Cooperative Agreement	Public/Barracks
Camp Headquarters	302	1941	Offices	Educational Partnership	Cooperative Agreement	Public/Barracks
Storehouse	303	1941	Storehouse	Educational Partnership	Cooperative Agreement	Service
Officers Latrine	304	1941	Latrine	Educational Partnership	Cooperative Agreement	Public/Barracks
Dispensary	305	1941	Dispensary	Educational Partnership	Cooperative Agreement	Service
Sewage Pump Station	306	1940	Pump Station	Vacant	NPS	Service
Sewage Pump Station	307	1940	Pump Station	Vacant	NPS	Service
Mess Hall	315	1941	Kitchen/ Dining	Educational Partnership	Cooperative Agreement	Public/Barracks
Post Exchange	316	1941	Exchange	Educational Partnership	Cooperative Agreement	Public/Barracks
Mess Hall	317	1941	Kitchen/ Dining	Educational Partnership	Cooperative Agreement	Public/Barracks
Dispensary	318	1941	Dispensary	Educational Partnership	Cooperative Agreement	Public/Barracks
Post Exchange	319	1941	Exchange	Educational Partnership	Cooperative Agreement	Public/Barracks
Enlisted Men's Latrine	320	1941	Latrine	Educational Partnership	Cooperative Agreement	Public/Barracks
Enlisted Men's Latrine	321	1941	Latrine	Educational Partnership	Cooperative Agreement	Public/Barracks
Power Plant	324	1941	Power Plant	Restroom	NPS	Service
NCO Quarters	335	1898	Housing	Day Care Center	Cooperative Agreement	Residential
Morgue	326	1905	Morgue	Restroom	NPS	Service

Appendix B: Recommended Plant Lists for Fort Hancock, 1 of 4

Recommended Mid-Height Shrubs for Residential Buildings

Latin Name	Common Name	Height	Shade Tolerance	Deciduous/ Evergreen	Native
Aronia arbutifolia	red chokeberry	9’	Intermediate	Deciduous	X
Aronia melanocarpa	black chokeberry	9’	Intermediate	Deciduous	X
Baccharis halimifolia	groundsel-bush	5’-12’	Intolerant		
Clethra alnifolia	summersweet	9’	Tolerant	Deciduous	X
Cornus sericea	redosier dogwood	7’	Intolerant	Deciduous	X
Cotoneaster divaricatus	spreading cotoneaster	5-6’	Intolerant	Deciduous	
Hibiscus syriacus	rose-of-sharon	8-12’	Intolerant	Deciduous	
Hydrangea macrophylla	bigleaf hydrangea	12’	Intolerant	Deciduous	
Ilex glabra	inkberry	9’	Tolerant	Evergreen	X
Myrica pensylvania	northern bayberry	9’	Intermediate	Semi-Evergreen	X
Pieris floribunda	mountain andromeda	6’	Tolerant	Deciduous	X
Prunus maritima	beach plum	6’	Intolerant	Deciduous	X
Rosa rugosa	saltspray rose	6’	Intolerant	Deciduous	
Sambucus Canadensis	American elder	5-12’		Deciduous	X
Vaccinium corymbosum	highbush blueberry	6-12’	Intermediate	Deciduous	X
Juniperus communis	common juniper	5-7’	Intermediate	Evergreen	X

Appendix B: Recommended Plant Lists for Fort Hancock, 2 of 5

Recommended Low Growing Shrubs for Residential Buildings

Latin Name	Common Name	Height	Shade Tolerance	Deciduous/ Evergreen	Native
Abelia x grandiflora	glossy abelia	3-6’	Intermediate	Deciduous	
Ceanothus americana	New Jersey tea	2-3’		Deciduous	X
Chaenomeles sp.	flowering quince	3-6’	Intermediate	Deciduous	
Cotoneaster apiculatus	cranberry cotoneaster	3’	Intermediate	Deciduous	
Cotoneaster horizontalias	rockspray cotoneaster	5’	Intermediate	Deciduous	
Leucothoe sp.	leucothoe	3-6’	Tolerant	Evergreen	X
Juniperus sabina	savin juniper	4-6’	Tolerant	Evergreen	
Juniperus conferta	shore juniper	1-2’	Intolerant	Evergreen	
Myrica gale	sweetgale	4’	Tolerant	Deciduous	X
Paeonia suffruticosa	tree peony	4-5’	Intermediate	Deciduous	
Potentilla fruiticosa	bush cinquefoil	1-4’	Intolerant	Deciduous	X
Rosa virginiana	Virginia rose	4-6’	Intolerant	Deciduous	X
Suaeda fruiticosa	shrubby goosefoot	2-3’	Intolerant	Evergreen	X
Vaccunium angustifolium	lowbush blueberry	6”-2’	Intermediate (needs acid soil)	Deciduous	X

Recommended Groundcover for Residential, Public Buildings, and Service Buildings

Latin Name	Common Name	Height	Shade Tolerance	Deciduous/ Evergreen	Native
Arctostaphylos uva-ursi	bearberry	6”-12”	Intolerant	Evergreen	X
Convallaria majalis	lily of the valley	6”	Tolerant	Deciduous	
Juniperus horizontalis	creeping juniper	1-2’	Intolerant	Evergreen	X
Juiperus procumbens	Japanese garden juniper	8-12”	Intolerant	Evergreen	
Opuntia humifusa	eastern prickly pear	3-4”	Intolerant	Succulent	X
Parthenocissus quinquefolia	Virginia Creeper	Vine	Intermediate	Deciduous	X
Pachysandra procumbens	Alleghany pachysandra	4-8”	Requires Shade	Deciduous in north	X
Thymus serphyllum	mother-of-thyme	4-6”	Intolerant	Semi-Evergreen	
Vinca Minor	periwinkle	3”-4”	Tolerant	Evergreen	

Recommended Tall Perennials for Residential Buildings

Latin Name	Common Name	Height	Sun/Shade Preference	Flower Color	Flowering Season
Alcea rosea	hollyhock	4’-5’	Full Sun	Pink, Rose, Red	Late Summer
Aster novae-angliae Aster novi-belgii	New England aster and New York aster	3-4’	Sun/Part Shade	Pink, Salmon	Late Summer
Baptisia tinctoria	wild indigo	3’	Part Shade	Yellow	May - September
Cimicifuga sp.	snakeroot	4-8’	Full Sun/Part Shade	White, Light Pink	Mid-Summer - Early Fall

Appendix B: Recommended Plant Lists for Fort Hancock, 3 of 5

Recommended Tall Perennials for Residential Buildings, continued

Delphinium sp.	delphinium	2-5’	Full Sun	Blue, Purple, Pink	Early - Late Summer
Digitalis sp.	foxglove	3-4’	Full Sun/Part Shade	Varied	Late Spring to Mid Summer
Fesctuca glauca	blue fescue	12”-5’	Full Sun/Part Shade	Known for Blue or Green Foliage	Ornamental Grass
Hibiscus moscheutos	swamp rose mallow	3-6’	Full Sun	White, Red, Pink	Mid-Summer - Early Fall
Liatris scariosa	blazing star	2-5’	Full Sun	Reddish Purple	August-September
Liatris spicata	gayfeather	3’	Full Sun	Reddish Purple	Mid Summer –Early Fall
Lupinus	lupines	3-4’	Full Sun	Varied	Early to Mid-Summer
Osmunda claytoniana	interrupted fern		Shade	Green Foliage	
Papaver orientale	oriental poppy	2-4’	Full Sun	Varied	Late Spring- Early Summer
Physostegia virginiana	Virginia lion’s heart	3’	Full Sun/Part Shade	White, Pink	Mid-Summer - Late Fall
Yucca filamentosa	yucca	3-5’	Full Sun	Distinctive foliage, central white flower spike	Mid-Summer

Recommended Mid-Height Perennials for Residential Buildings

Latin Name	**Common Name**	**Height**	**Sun/Shade Preference**	**Flower Color**	**Flowering Season**
Aquilegia sp.	columbine	1-3’	Full Sun/Part Shade	Varied	Late Spring to Early Summer
Asclepias tuberose	butterfly milkweed	2’	Full Sun	Varied	Mid-Summer to Early Fall
Astilbe sp.	astilbe	2-3 1/2’	Part Shade/Full Shade	Red, White, Pink	Early to Mid-Summer
Chrysanthemum sp.	chrysanthemum	1-3’	Full Sun/Part Shade	Varied	Mid-Summer to Late Fall
Coreopsis lanceolata	tickseed	1-2’	Full Sun/Part Shade	Yellow	Late Spring
Dicentra spectabilis	bleeding heart	2’	Part Shade	Red, Pink, White	Late Spring to Early Summer
Hemerocallis sp. (species only - no cultivars)	daylily	1 1/2-4’	Full Sun/Part Shade	Varied	Early to Mid-Summer
Hosta decorata and *fortunei* - avoid cultivars	plantain lily (hosta)	1-3’	Part Shade/Shade	Widely used for green foliage	Summer
Hyssop officianalis	hyssop	2’	Full Sun	Blue, Pink	Mid to Late Summer
Iris germanica	bearded Iris	1-3’	Full Sun/Part Shade	Varied	Late Spring to Early Summer
Lavendula angustfolia	lavender	2-3’	Full Sun	Light Blue	Late Spring to Summer
Lobelia cardinalis	cardinalflower	2-3’	Part Shade	Red	Summer to Early Fall (may also be used as an annual)
Lychnis coronaria	rose campion	3’	Full Sun	Varied	Early to Late Summer
Mentha spicata	peppermint	2’	Part Shade	Dark Green Foliage	
Monarda didyma	bee-balm	3-4’	Full Sun/Part Shade	Red, Pink, Purple	Mid-Summer to Late Fall
Paeonia sp.	peony	2-4’	Full Sun/Part Shade	Red, Pink, White, Yellow	Late Spring to Early Summer
Phlox paniculata	garden phlox	6”-4’	Full Sun/Part Shade	Pink, White, Blue, Purple	Late Spring to Early Summer
Rudbeckia hirta	black-eyed susan	3’	Full Sun	Yellow	Late Summer
Solidago sp.	goldenrod	1-4’	Full Sun/Part Shade	Yellow	Late Summer to Mid Fall

Appendix B: Recommended Plant Lists for Fort Hancock, 4 of 5

Recommended Low Growing Perennials for Residential Buildings

Latin Name	Common Name	Height	Sun/Shade Preference	Flower Color	Flowering Season
Achillea sp.	yarrow	12”-4’	Full Sun	Yellow, White, Red, Pink	Mid-Spring to Early Summer
Alyssum saxatile	alyssum	12”	Full Sun	Yellow	Late Spring
Arabis sp.	rock cress	2-10”	Full Sun	White, Pink	Early Summer to Mid Fall
Armeria maritima	common thrift	6-12”	Full Sun	Red, Pink, White	Late Spring to Early Summer
Aurinia saxatilis	golden-tuft	6-12”	Full Sun	Yellow	Mid-Spring to Early Summer
Dianthus sp.	pinks	4-15”	Full Sun	Red, Pink, White	Late Spring to Early Summer
Dicentra canadensis	squirrel corn	12”	Shade	White	Spring
Heuchera sanguinea	coral bells	12-18”	Part Shade	Red, White, Pink	Late Spring to Late Summer
Limonium sp.	sea lavender	8-12”	Full Sun	Yellow to Lavender	Mid to Late Summer
Lychnis viscaria	German catchfly	1-3’	Part Shade	Purple, Pink, Red, White	Spring to Summer
Phlox divaricata	woodland phlox	8-12”	Part Shade	Purple, Pink, White, Blue	Spring to Early Summer
Potentilla sp.	cinquefoil	12”	Full Sun	Orange, Yellow, Red	Early to Late Summer
Erigeron sp.	fleabane	4-30”	Full Sun	Blue, Pink	Early to Late Summer
Gyposphilia sp.	baby’s breath	1-3’	Full Sun	White, Light Pink	Early Summer to Early Fall
Iberis sempervirens	evergreen candytuft	1’	Full Sun/Part Shade	White	Mid-Spring to Early Summer
Phlox sublata	moss phlox	4”	Sun	White, Purple	Spring
Sedum sp.	stonecrop	3”-3’	Full Sun/Part Shade	Widely used for waxy light green foliage	Summer
Senecio sp.	groundsel	8-18”	Full Sun/Part Shade	Yellow	Mid-Spring to Late Spring
Thymus	thyme	4-8”	Part Shade	Delicate green foliage	

Recommended Annuals for Residential Buildings

Latin Name	Common Name	Height	Sun/Shade Preference	Flower Color	Flowering Season
Ageratum houstoniatum	ageratum	6”-18”	Sun/Part Shade	Blue, White, Pink	Summer to Fall
Alcea rosea	hollyhock	4’-5’	Sun	Pink, Rose, Red	Late Summer
Caleddula officinalis	pot-marigold	1-2’	Sun/Part Shade	Gold, Yellow, Orange	Summer to Fall
Centaurea sp.	cornflower	2 1/2’	Sun	Purple, Blue, Yellow, White	Late Spring to Fall
Clarkia sp.	clarkia	18”-3’	Sun/Part Shade	White, Pink, Blue	Late Spring to Fall
Cleome sp.	spiderflower	1-3’	Sun/Part Shade	White, Pink, Blue	Summer to Fall
Cosmos sp.	cosmos	10”	Sun	Varied	Summer-Fall
Eschscholtzia californica	California-poppy	2’	Sun	Orange, Red, Yellow, Pink	Early to Late Spring
Gaillardia sp.	gaillardia	2’	Sun	Yellow, Red	Late Summer
Glaucium corniculatum	sea-poppy	1 1/2”	Sun	Red	Summer
Helichrysum bracteatum	strawflower	3’	Sun	Various	Mid-Summer to Late Fall

Appendix B: Recommended Plant Lists for Fort Hancock, 5 of 5

Recommended Annuals for Residential Buildings, continued

Lobularia maritime	sweet alyssum	1’	Sun	Blue	Late Spring to Summer
Lathyrus odoratus	sweetpea	Vine	Sun	Yellow, Purple	Early Summer
Nigella damascene	love-in-a-mist	18”-2’	Sun	Light Blue, White	Spring to Early Summer
Papaver sp.	poppy	2’	Sun	Varied	Summer
Petunia sp.	petunia	6”-3’	Sun	Varied	Summer
Portulaca sp.	portulaca	8”	Sun	Varied	Summer
Salvia sp.	sage	1-3’	Sun	Varied	Summer
Scabiosa sp.	scabiosa	1-3’	Sun	Dark Purple, Rose, White	Summer
Tithionia rotundifloia	tithonia	3-6’	Sun	Orange, Yellow	Summer
Tropaeolum sp.	nasturtium	6”-2’, vine	Sun	Yellow, Orange, Red	Summer
Verbena tenera	sand verbena	2”	Sun	White, Pink, Purple	Late Spring to Fall
Zinnia sp.	zinnia	18”-3’	Sun	Varied	Summer to Fall

Note: This list of annuals may also be used for planting in small pots placed on porches and porch stairs. Plantings in window boxes hung from windowsills will not be allowed, however planting boxes smaller than 3’ x 1’ x 1’ may be hung from the porch railings of buildings 1 through 21, as stated in the EA.

Recommended Plant Material for Foundation Plantings of Public/Barracks Buildings

Latin Name	Common Name	Height	Shade Tolerance	Deciduous/ Evergreen	Native
Ilex glabra	Inkberry	9’	Tolerant	Evergreen	X
Myrica pensylvania	Northern Bayberry	9’	Intermediate	Semi-Evergreen	X
Pieris floribunda	Mountain Andromeda	6’	Tolerant	Deciduous	X
Vaccinium corymbosum	Highbush Blueberry	6-12’	Intermediate	Deciduous	X
Juniperus communis	Common Juniper	5-7’	Intermediate	Evergreen	X

Appendix C: Turfgrass Management Recommendatioins, 1 of 3

Fort Hancock Turf Grass Management Recommendations

Identify and apply necessary soil amendments

- Amendments are added to soil for increasing porosity, air exchange capability, drainage, and to enhance resistance to compaction. In severely compacted situations, the entire soil profile/character can be modified. The addition of porous materials, such as AXIS, a diatomaceous earth product, can help improve turf conditions in soils that are repeatedly compacted. These products resist compaction by creating stabile pores or pockets of air and water space within the soil and could be considered for some of the highly compacted areas adjacent to walks and parking areas at SPAR.

- Maintaining proper soil pH and fertility is critical to achieving an effective turf management program. Soil management practices at the park should be implemented to adjust and maintain adequate pH and fertility to support turf growth. A correct pH range allows turf to absorb nutrients, such as nitrogen (N), potassium (K), magnesium (Mg), and calcium (Ca) from the soil. If pH is too high or too low, nutrients may be "locked" onto soil particles and not be available to plants. Most soils in the Northeast are somewhat acidic and require routine limestone applications to keep pH in a favorable range for turf. Optimum turfgrass growth occurs at a pH of 6.4 - 6.8.

  The pH range of soils at a site can vary substantially from area to area and from year to year. Lime applications should be based on soil test results only. Applications should never exceed 50#/Total Square Footage (TSF)/application. If soil pH is low enough to require more than 50#/TSF, two or more applications at different times in the year should be made.

  There are three types of limestone that can be applied to turf for soil pH adjustment:

  1. Calcitic ($CaCO_3$) raises pH
  2. Dolomite ($CaMg(CO_3)_2$, raises pH while adding magnesium
  3. Gypsum ($CaSO_4$), does not change pH

  Limestone is not a fertilizer. Rather, it is a material that is used to raise soil pH with the objective of improving nutrient uptake by the plant. Proper soil pH increases the efficiency of fertilizing by allowing the nutrients applied to the soil to be more readily available to the turf.

  Soil samples should be collected once or twice each year to determine pH levels. The test results provided will include recommendations on the amount of lime that needs to be applied to properly adjust the soil pH.

- The nutritional health of turfgrass is dependent on a fertilization program that is developed using information derived from soil tests. Fertilizer applications should be timed to provide nutrients to plants when they use the material effectively. In the northeast, fertilizer provides the best results when applied in late August, September and October. One pound of actual Nitrogen per 1000 sq. ft. should be supplied with each application.

  Actual applications should be based on annual soil test results collected from each lawn area. In the absence of a soil test, a fertilizer with a 3-1-2 or closely equivalent ratio of nitrogen, phosphorous and potassium should be used.

  The implementation of a natural organic fertilizer program will enhance the level and activity of beneficial microorganisms. These microorganisms will improve the decomposition rate of thatch and other organic matter resulting in an increase of water and nutrient holding capacity of the soil, increased air and water pore space, and improved resistance to compaction. An organic fertilization program also helps to minimize the use of pesticides and other synthetic products on turf.

Appendix C: Turfgrass Management Recommendatioins, 2 of 3

Manage Soil Compaction

- Soil compaction results from the loss of air and/or water space between soil particles. It is typically a result of over use from pedestrians, equipment or vehicles. Excessive soil compaction reduces the effectiveness of a soil to support turf growth, limits water and air exchange and increases erosion. Ultimately, if left untreated, soil compaction will result in the loss of turf.

- Areas of soil compaction can be corrected through mechanical aeration, however, the timing of aeration and the equipment used needs to be thoughtfully selected. Poor timing and inappropriate equipment can worsen the soil compaction problem.

- Aerating the soil with mechanical equipment can effectively minimize the compaction. While there are several different types of aerators available, a core aerator provides the best results for most typical turfgrass situations. A core aerator removes narrow cores of soil and thatch from the lawn producing a series of small 2-4" deep holes. These holes allow water, air, and fertilizer to reach turf roots.

- The actual process can temporarily injure turf roots. It is best to accomplish mechanical aeration during the most active growth periods of grass, i.e. early spring and/or fall. This will encourage quick recovery of turf after any injury that may occur.

Renovate Lawn Areas

- Periodic or cyclic renovation of turf areas should be anticipated. The frequency can vary from every two years to twenty years or more, depending on the use of the area, level of care, and weather extremes.

- Overseeding will be required to fill in bare spots and even out lawn coverage. Use a slicer seeder in the early fall only, targeting areas in need of renovation. The seed delivery rate of the slicer should be set moderately low, applying 1-3 lbs of seed per thousand square feet

- Lawn may also be renovated using a broadcast seeder. Scarify the surface with a slicer seeder or garden rake to prepare the seed bed. To ensure a uniform application, use a drop type or centrifugal spreader at half of the recommended rate, walking in two directions at right angles to one another. Following the seeding, the area should be lightly raked to incorporate the seed into the top ¼" of soil. Be careful not to rake the seed too deeply into the soil, as the seed needs exposure to sunlight for germination. Roll the seeding area lightly to press the seed into the soil and to ensure good seed to soil contact.

- Renovate lawn areas during the late summer or early fall. Temperatures and moisture levels are favorable for growth, while competition from weeds is reduced. This provides the new seeds enough time to germinate before the onset of winter.

Alter Mowing Practices

- Lawns should be mowed often, never removing more than one third of the total height. Grass height should be 2" for spring and fall and 2 ½" for the summer months. Taller plants photosynthesize energy readily, shade out low growing weeds such as crabgrass, and develop more extensive root systems. Grass height taller than 3" is not recommended.

- Mowing should begin around mid-April and continue until the grass has stopped growing in the fall.

- Mower blades should be sharpened regularly to avoid tearing the leaves. If the blades are dull, the turf will appear grayish after mowing.

- Clippings should be left on the lawn unless a disease outbreak occurs.

- The mowing pattern should be routinely changed so that grooming lines do not occur.

Appendix C: Turfgrass Management Recommendatioins, 3 of 3

Manage Thatch Build-Up

- The thatch layer should not exceed 1/2" because build-up reduces growth and quality of the grass and the effectiveness of fertilization and irrigation.
- Avoid fertilizer with high nitrogen content.
- Use organic fertilizers to assist in the breakdown of thatch by promoting the activity of soil microorganisms.

Manage Weed Growth

- Initially, attempts should be made to improve the quality of the turf by adjusting soil pH and fertility levels and by mechanically overseeding the area.
- Use top quality grass seed with less than .1% weed content.
- Some chemical weed management will also help re-establish the turfgrass. Consult with the regional IPM coordinator to discuss the use of a pre-emergent herbicide, such as Siduron (commercial name Tupersan) that is registered to use in newly seeded lawns.

Provide turfgrass management training for site staff

- Site staff should receive introductory and annual training in the principles and practices of turf management.

Appendix D: Lighting Study of Barracks Row, Generated by Quattro Lighting, 1 of 1

Luminaire Schedule

Project: Fort Hancock

Symbol	Qty	Label	Arrangement	Lumens	LLF
	6	OP3N-70hps	SINGLE	6300	0.700

Numeric Summary

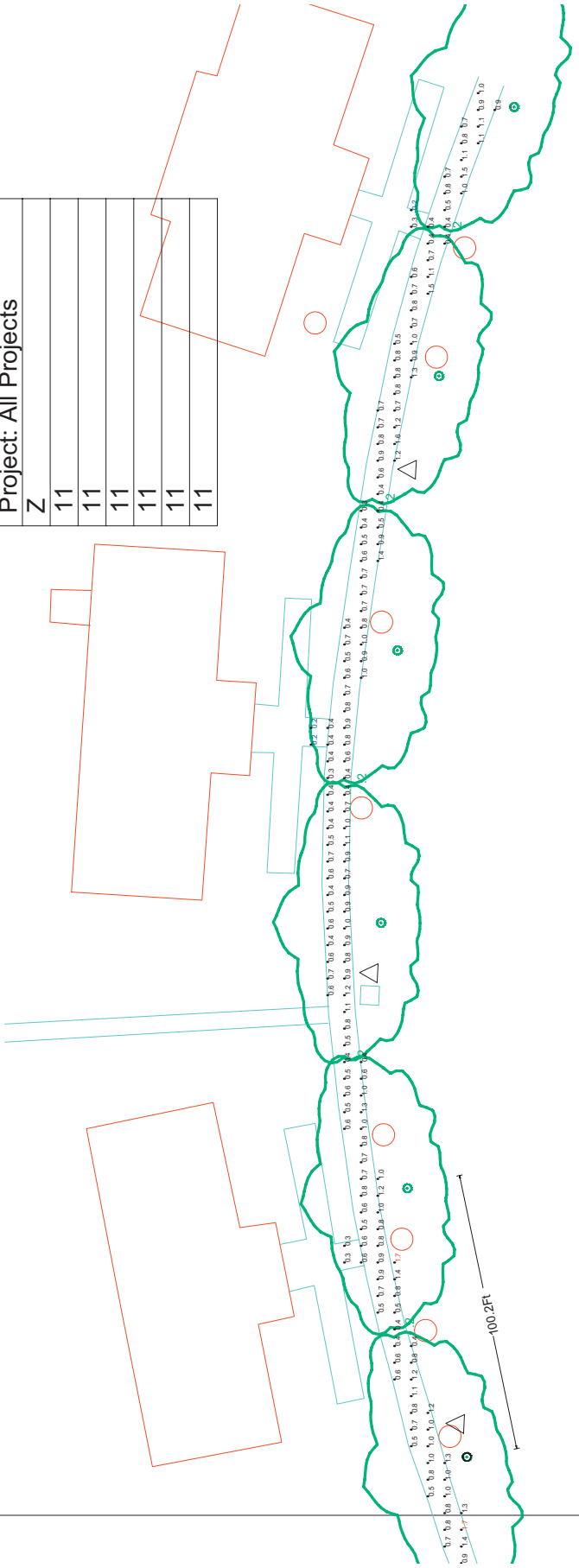
Project: Fort Hancock

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Typical #1	Illuminance	Fc	0.76	1.7	0.2	3.80	8.50

Luminaire Location Summary

Project: All Projects

Z
11
11
11
11
11
11



National Park Service
U.S. Department of the Interior

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